

REMARKS/ARGUMENTS

Claims 1-15, as previously presented, remain pending.

Product By Process: Structural Characteristics Of Process Step Must Be Considered

The Examiner states that the claimed invention is a product-by-process, in that the connection path of the optical connector is defined by the process by which it is made: a connection path written within the three-dimensional bulk dielectric. The Examiner goes on to state that this limitation does not distinguish over Flory (US 2004/0126055) because only the final product is relevant, and not the process of making the product. In support of this statement, the Examiner refers to MPEP 2113, which states, *inter alia*: “The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior art was made by a different process.”

However, MPEP 2113 also states:

The structure implied by the process steps should be considered
when assessing the patentability of product-by-process claims over
the prior art, especially where the product can only be defined by
the process steps by which the product is made, or where the
manufacturing process steps would be expected to impart
distinctive structural characteristics to the final product. See, e.g.,
In Re Garnero, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA
1979). [emphasis added]

In Re Garnero clearly establishes that a process step can be construed as a structural characteristic of a product, and that the matter to resolve is whether the product as claimed is patentably distinguishable over the prior art in view of the structural limitations defining the product. Specifically, in discussing the construction of claim 1, the Court in *In Re Garnero* stated:

The trouble with the solicitor's approach is that it necessarily assumes that claim 1 should be construed as a product claim containing a process, rather than structural, limitation. However, it seems to us that the recitation of the particles as "interbonded one to another by interfusion between the surfaces of the perlite particles" is as capable of being construed as a structural limitation as "intermixed," "ground in place," "press fitted," "etched," and "welded," all of which at one time or another have been separately held capable of construction as structural, rather than process, limitations.

Applicant submits that the claimed product is not merely defined by the process by which it is made. The claimed product has distinctive structural characteristics imparted by the claimed limitation, and that such structural characteristics must be considered by the Examiner when assessing the patentability of the claims. Claim 1 of the present application recites "a connection path written within the three-dimensional bulk dielectric" [emphasis added]. Applicant submits that the limitation of claim 1 is certainly on the same footing as any of the expressions "intermixed," "ground in place," "press fitted," "etched," and "welded," discussed *In Re Garnero* above, and that the impugned limitation imparts observable, physical and structural characteristics to the claimed optical connector.

The expression "written within the three-dimensional bulk dielectric" clearly refers to the process of optically writing a connection path in a bulk dielectric as described in the application as filed, at least at paragraph [0030] and at Fig. 3. Writing an optical connection path within a three-dimensional bulk dielectric imparts clear structural characteristics, such as the index of refraction of the optical connection path being higher than that of the bulk dielectric (see e.g. U.S. Publication No. 2003/0235385, para. [0054], incorporated by reference in the present application), and the index of refraction profile of the optical connection path being correlated to the optical signal energy intensity profile used in forming the optical connection path (see e.g. PCT Application No. WO 02/16070, p. 10 - 11, incorporated by reference in the present application). The connection path is also written within the bulk dielectric. The term "within" is

defined as meaning "on the inside or on the inner side: INTERNALLY, INSIDE" (Webster's Third New International Dictionary). Thus, the fact that the connection path is "within" the three-dimensional bulk dielectric also imparts an observable structural and physical characteristic to the claimed optical connector. Therefore, Applicant submits that the optical connector having an optical connection path "written within the three-dimensional bulk dielectric" is capable of clear structural construction, and that the structure implied by the process steps should be considered when assessing the patentability of the claims of the present application (MPEP 2113). Applicant further submits that these distinctive structural characteristics will show claim 1, and its dependent claims, to be patentable over Flory.

Claim Rejections Under 35 U.S.C. § 102(e)

The Examiner rejected claims 1, 3-10, 13 and 14 as being anticipated by Flory. Applicant respectfully disagrees for at least the following reasons.

Flory discloses a photonic crystal interferometric switch (30). The switch (30) comprises a two-dimensional photonic crystal slab (31), a series of dielectric posts (39) disposed in air (see e.g. paras. [0013] and [0030]), an input portion (32), output portions (33, 34) and an interference channel (35). The input and output portions, and the interference channel, are defined by the absence of posts (39). There is no suggestion or teaching in Flory that the interference channel is written within the dielectric posts. The switch (30) further comprises a resonator region (38) having a connecting channel (36) defined by a missing post (39) and the presence of posts (24) larger than the posts (39) in the other parts of the switch. Light is input at the input portion (32) and the light intensity at the output of the switch is controlled by tuning the refractive index of the posts (24) in the resonator region (38), the tuning being accomplished by the tuning member (22). The space surrounding the input portion (32) and the output portions (33, 34) is occupied by dielectric posts (39, 24) and air (see e.g. para. [0030]). Thus, there is no suggestion or teaching in Flory that any connection path is written within a dielectric.

By contrast, the invention as claimed in claim 1 is to an optical connector comprising a three-dimensional optically-transmissive bulk dielectric material, e.g. prism 112 in Fig. 12, that can be abutted to an input connection face of an input optical component and to an output face of an

output optical component. The optical connector of claim 1 further comprises an optical connection path written within the three-dimensional bulk dielectric. The connection path optically connects the input connection face to the output connection face. The invention as claimed in claim 1 has no relation to the photonic crystal structure as taught by Flory.

Applicant submits that the plurality of rods (39, 24), or the combination of rods and air of Flory, cannot be construed to mean an optical connection path written within a three-dimensional bulk dielectric as recited in claim 1.

First, with respect to the optical connection path being written within the bulk dielectric, Applicant submits that the structural characteristics of such an optical connection path distinguishes claim 1 over Flory. As mentioned above, the structural characteristics of the connection path of claim 1 include the optical connection path having an index of refraction higher than that of the surrounding material and, the optical connection path having an index of refraction profile correlated to an optical signal energy intensity profile used in forming the optical connection path. Neither of these characteristics is present in the input and output regions of Flory's device, or in any other region of the device.

The input and output regions of Flory's device are defined by the absence of dielectric posts. This means that the input and output regions comprise only air, which has an index of refraction lower than that of the dielectric posts, or equal to that of the air between the posts, not higher than those indices. Additionally, Flory fails to teach or suggest any type of writing of input and/or output regions having an index of refraction profile correlated to an optical signal energy intensity profile used in writing the optical connection path.

Secondly, what Flory teaches is an arrangement of a plurality of dielectric posts in air, the arrangement defining an input portion (32) and output portions (33, 34), not a three-dimensional bulk dielectric having an optical connection path written therein as recited in claim 1. A single dielectric post of Flory does nothing in itself. Rather, it is the arrangement of the posts that defines the input and output portions of the switch (30). Should a single dielectric post be construed as meaning a three-dimensional bulk dielectric, as recited in claim 1, then Flory fails to teach or suggest any type of optical connection path written within that single dielectric post.

Therefore, Applicant submits that Flory fails to teach or fairly suggest an optical connector as claimed in claim 1. Flory simply does not teach or suggest a three-dimensional optically transmissive bulk dielectric together with an optical connection path written within the three-dimensional dielectric as recited in claim 1. Withdrawal of the rejection of claim 1 and of its dependent claims 3-10, 13 and 14 under 35 U.S.C. § 102(e) is respectfully requested.

Claim Rejections Under 35 U.S.C. § 103(a)

The Examiner rejected claims 2, 11, 12 and 15 as being obvious in view of Flory.

Claims 2, 11, 12 and 15 ultimately depend on claim 1, which, Applicant submits, is allowable for at least the reasons given above in response to the anticipation rejection. Since Flory does not teach all the claimed limitations of claim 1, it cannot teach or reasonably suggest all the claimed limitations of a claim dependent from claim 1. Therefore, there is no showing of prima facie obviousness. Withdrawal of the rejection under 35 U.S.C. § 103(a) is respectfully requested.

No fee is believed due for this submission. However, Applicant authorizes the Commissioner to debit any required fee from Deposit Account No. 501593. The Commissioner is further authorized to debit an additional amount required, and to credit any overpayment to the above noted deposit account.

It is submitted that this application is now in condition for allowance, and action to that end is respectfully requested.

Respectfully submitted,
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